RIP CURRENTS

Rip currents appear to persist for weeks or even months at the same places along the shore, although they become dangerously strong only under certain conditions, according to new research by University of Florida coastal engineers.

The findings, which could lead to a better method of predicting when and where rip currents may occur, conflict with the prevailing view of the currents as spontaneous and short-lived events. They come at a time when drownings in Florida tied to rip currents usually reach a seasonal high.

"We used to believe that the formation of rip currents was relatively spontaneous and correlated with individual events such as large storms," said Bob Dean, a UF professor of civil and coastal engineering. "Now, we're starting to believe rip currents persist for longer time periods at various strengths -- sometimes as long as several weeks or months."

For the study, Dean and Jamie MacMahan, a UF doctoral student in civil and coastal engineering, analyzed thousands of time-elapsed photos of a rip current-prone section of the beach on North Carolina's Outer Banks. Shot hourly for 2½ years from a 100-foot tower at a federal research facility, the photos revealed dark swaths of the ocean the researchers tied to rip currents. The swaths expanded or shrank as weather and surf conditions changed -- but remained in the same place along the beach even after storms.

"We've identified some that start in May and last until September," MacMahan said.

Rip currents typically occur as water pushed between a sandbar and the beach rushes seaward through a channel in the bar. Dean and MacMahan's research found that these channels persist even as wave action moves the sandbar toward the beach. Only a particularly large storm or hurricane moves the channels, the study found.

The study shows that rip currents likely are much more common that had been thought, becoming noticeable -- and dangerous -- only when the flow of water is sufficient to create a strong current. That tends to occur when storms or particularly strong tides push large amounts of water toward shore, piling water into the gap between the sandbar and beach, Dean said. A strong rip current moves at about three feet per second, as fast as an Olympic swimmer in a 50-meter sprint, MacMahan said.

Dean and MacMahan said the observations conflict with some traditional theories about rip currents, which hold that the currents form at nodes in an along-shore propagating wave, which moves parallel to the shore. The new

findings suggest that certain parts of the shoreline may be more prone to rip currents than others, and that once coastal engineers know more about the ingredients of a dangerous rip current they may be able to predict when one will occur, the researchers said.

Such a development couldn't come soon enough. In Florida, rip currents resulted in an average of 19 deaths annually between 1989 and 1999, more deaths than caused by hurricanes, tornadoes, storms and lightning combined, according to a study by the National Weather Service's East Central Florida Rip Current Program.

With a total of 30 and 29 rip current-related drownings between 1989 and 1999, Dade and Volusia counties, respectively, had the highest rip current mortality rates. But rip currents caused fatalities in 24 of Florida's 25 counties with sandy beaches. The peak month for rip current-related drownings is April, but the second most drownings occur in September and October, the study found.

The two-year UF study, funded with a $60,000 grant from Florida Sea Grant, is only half completed. This year, MacMahan plans to use a personal watercraft equipped with a global positioning system, depth meter and other equipment to learn more about the size and shape of the sandbar channels, among other information.

Contrasting the earlier research, based at a U.S. Army Corps of Engineers field research laboratory in Duck, N.C., this year's field work is set for Ormond Beach in Volusia County. There, a video camera attached to a lifeguard stand already is recording pictures of rip currents along part of the beach.